

## **REMARKS/ARGUMENTS**

Claims 1-49 are pending in this application. Claims 1-44 are under examination and these claims are all rejected. Claims 45-49 have been withdrawn by the Examiner from further consideration in this application as being directed to a non-elected invention.

In this response claims 1, 9, 28, 37 and 40 are amended to more clearly recite the process/substance recited therein. The claim amendments are all entirely supported by the application as originally filed and thus there is no issue of new matter. Entry of the amendments into the file of the application is, therefore, respectfully requested. Further to the above, claims 11 and 24 are canceled from the application without prejudice or disclaimer. Additionally, the dependency of claims 12, 13 and 25 has been changed due to the cancellation of, respectively, claims 11 and 24.

Following entry of this Amendment the claims pending in the application will be 1-10, 12-23 and 25-49, wherein nos. 1-10, 12-23 and 25-44, as amended are under examination while claims 45-49 are withdrawn.

### **Claim Amendments Under 35 U.S.C. §112, Second Paragraph**

Claims 9 and 37 are rejected as being incomplete as allegedly omitting essential steps. In response, the claims are amended in a manner which is believed to overcome the rejection.

Claims 28 and 40 are rejected due to the fact that they are allegedly unclear as to how many non-sucrose substances are being claimed. The claims have, therefore, been amended to make it clear that six non-sucrose substances, i.e., (a) - (f) are being claimed.

Claims 11 and 24 are rejected as allegedly failing to further limit the base claims. In response the rejected claims are canceled from the application without prejudice or disclaimer.

Based on the claim amendments and cancellations discussed above, the Examiner is respectfully requested to reconsider and withdraw all of the rejections under 35 U.S.C. §112, second paragraph.

### **Claim Rejections Under 35 U.S.C. §103**

Claims 1-2, 6, 9-11, 14-21, 23-24, 26-27, 32, 35, 37, 39 and 42-43 are rejected under 35 U.S.C. §103 as being allegedly “obvious” to one having an ordinary level of skill in this art over Loseva (RU 2 105 817 C1) in view of Mengelbier (1,372,891). The rejection is respectfully traversed.

Regarding, first, the ‘primary’ reference (i.e., Loseva), applicants submit that the presently claimed process is readily distinguishable over the disclosure contained therein. To begin with, Loseva requires the return of separated slurry, following saturation, back into the liming stage, as well as teaching one skilled in the art to undertake an alkaline treatment of the slurry that is removed following saturation in a separate step, neither of which operations are practiced in the presently claimed process according to applicants’ independent claims.. That is, in the presently claimed process nothing is removed or recirculated within the product flow from the introduction of the sugar beet raw juice to the end of the first and, optionally second, carbonation treatment, except for the removal of the coagulate from the pre-liming juice. In the main product stream sugar beet raw juice converts to a pre-liming juice and then into a clear pre-liming juice. It enters the first (and optionally a second) carbonation as a clear pre-liming juice and it leaves the first (and optional second) carbonation as a purified juice commonly known as “carbonation juice”.

Thus, all of the treatments, i.e., pre-liming by adding milk of lime, the addition of at least one copolymer of acrylamide and sodium acrylate thereto, the removal of coagulate and the performance of a first (and optionally a second) carbonation are carried out in the main product stream in the case of the presently claimed process. This is in contrast to the process described in Loseva in that, unlike Loseva, applicants’ process utilizes no side stream or recirculation path where slurry is treated and wherein, furthermore, there is no addition of milk of lime to a recirculated suspension of a first saturation deposit as there is in Loseva.

Further to the above, with regard to the Examiner’s argument in the portion of the Action bridging pp. 5-6, i.e., respecting the amount of lime to be added during step (d), i.e, main liming, applicants submit that Loseva et al. discloses the addition of 0.1 to 0.3% of CaO to the separated pre-defecation (i.e., pre-liming) deposit mixed with the recirculated suspension of the first

saturation deposit, not, however, to the clarified pre-liming juice from which the deposit (i.e., the coagulate) has been separated off. In contrast to the analysis set forth in the Office Action, there is no disclosure in the Loseva reference regarding the amount of milk of lime added in the main defecation (i.e, main liming) stage. Even if one having ordinary skill in the art were to find it suggested in Loseva that lime juice may be added somewhere within a juice purification process in an amount of 0.1 to 0.3% CaO, there is still no teaching, or even a suggestion, provided in the reference regarding the addition of “about 0.6g CaO/100ml.” which is at least twice any possible amount taught in Loseva. Applicants respectfully submit, furthermore, that they do not see how the amount recited for use in their claims, which is from 2x to 6x the amount disclosed in Loseva, can be deemed to be equivalent as alleged in the analysis provided in the Office Action.

Further to the arguments presented above, applicants submit that they have amended the recitation of step (b) in claim 1 to recite that the copolymer of acrylamide and sodium acrylate is added as a “polyanionic flocculation assistant” in a concentration of 1 to 8 ppm. Support for this amendment is found in the portion of the specification bridging pp. 15-16. This amendment is offered for the purpose of clarifying the function and concentration of the copolymer added to the pre-liming juice in the claimed process. It further demonstrates that there is a substantial difference between the “polyacrylamide solution” added as a flocculant during predefecation in the method according to Loseva et al. and the copolymer added as a flocculation assistant in the process claimed by applicants.

According to Loseva et al. the solution of polyacrylamide is used to form the precipitate and/or coagulate of non-sucrose substances. In order to achieve that end the polyacrylamide solution is added in an amount which is about 10x more than the amount used in the presently claimed method. Furthermore, the polyacrylamide solution according to Loseva et al. is added early in the predefecation stage , at a pH of 9.5 to 10.1. In contrast, in the presently claimed process a copolymer of acrylamide and sodium acrylate is added in a separate step (b), i.e., after the precipitate and/or coagulate of non-sucrose substances has been formed in the preceding step (a). As taught in applicants’ specification, the polyanionic flocculation assistant does not function as a coagulation agent but, rather, serves as a flocculation aid (see, e.g., p. 7, lines 13-16). The addition of this material brings about the agglomeration of solid particles, that are

already formed in a preceding step, into larger units or "flocs" (see, e.g., p. 16, lines 1-6). In the present process the flocculation assistant is added at a time when the precipitate and/or coagulate have already been formed. Thus the flocculate assistant used in the presently claimed process does not induce or form the precipitate or coagulate itself but rather it assists in clogging the precipitate and/or coagulate into larger particles or flocs to permit an easier removal thereof from the predefecation juice.

Loseva et al. teaches to add a polyacrylamide solution during an early phase of predefecation at a pH of 9.5 to 10.0 (see, e.g., p. 3, last 6 lines of the translation provided by the Office). In contrast, the presently claimed process involves adding the polyacrylamide copolymer to predefecation juice after preliming is completed at a pH of about 11.5, which corresponds to an alkalinity of about 0.1 to 0.3g CaO/100 ml. (see p. 11, first paragraph, of applicants' specification). The addition of flocculant according to Loseva et al. in an about ten times lower amount (than that used in applicants' process) at a pH of 11.5 would not, however, result in a precipitation, coagulation, flocculation or any other kind of purification

Further to the above, applicants' method involves separating off the coagulated/precipitated non-sucrose substances already present in the predefecation stage; that is, removing the coagulate from the pre-liming juice, wherein the main liming is performed following the removal of the coagulate. In contrast, however, one having ordinary skill in this art and following the precepts of Loseva would not find any teaching or suggestion within the subject reference to reduce the amount of polyanionic flocculant by about one order of magnitude or to add the flocculant at a pH of about 11.5 - corresponding to about 0.1 to 0.3 g CaO/100 ml (as recited, e.g., in applicants' independent claims 1, 18 and 27). The presently claimed process, thus, is not characterizable as an "optimization" of reaction conditions taught or even suggested in Loseva. By "modifying" Loseva toward the process steps recited in applicants' claims one would, in fact, be led toward less efficient or even non-operative embodiments.

A further significant difference between the process according to applicants' claims and that disclosed and/or suggested by Loseva taken in combination with Mengelbier (1,372,891) has to do with the differences between the molecule used as a flocculant according to Loseva versus the molecule used as a flocculation assistant in the present process (as now claimed). The

Loseva reference discloses only a “polyacrylamide solution”, without providing any detail regarding the structure and molecular weight of the compound. In contrast to Loseva however, applicants’ claimed process utilizes a different material, i.e., which is a copolymer of polyacrylamide and sodium acrylate. There is no teaching or even a suggestion in Loseva concerning the use of such a copolymer. Furthermore, applicants dispute any contention that their copolymer of polyacrylamide and sodium acrylate could be characterized under the generic term “polyacrylamide”.

To provide further clarification, attached at the end of this response is a side-by-side comparison prepared by the applicants that sets forth the differences between the uses of the “flocculants” disclosed in Loseva versus the “flocculation aids” claimed for use in applicants’ process. The attached table does not include a listing of all of the differences between applicants’ claimed method and Loseva, only those in regard to the flocculants/flocculation assistants. The table, then, provides additional evidence of the distinctiveness of the process as recited in applicants’ claims.

Applicants recognize, of course, that the present rejection is based not on Loseva et al. alone, but on what would be suggested to one having an ordinary level of skill in this art by Loseva taken in combination with Mengelbier. Loseva et al. , however, is clearly the ‘primary’ reference with Mengelbier only being combined therewith due to its disclosure that sugar beets are a source of sugar sap (see, e.g, the portion of the Office Action bridging pp. 6-7). Applicants recognize the caveat, typically cited by Examiners making these type of rejections, that one cannot attack a “combination” obviousness rejection by attacking the references individually. While this is understood, it is believed that the Examiner will agree that applicants are not claiming to have discovered that sugar beets are a source of sugar sap. Rather they are claiming a process for extract purification which the Examiner is arguing is disclosed or at least suggested by the disclosure contained in Loseva. For this reason applicants have predominantly focused the arguments above on the differences between their claimed method and the methodology taught/suggested by Loseva.

However, even combining the teaching contained in Mengelbier with that found in Loseva, one does not come any closer to the claimed process. That is, the teaching credited to

Mengelbier as to sugar beets being the source for sugar sap clearly would not remedy the deficiencies, noted above, of the disclosure contained in Loseva. Thus, based on the claim amendments and arguments presented herein, applicants submit that the combined teachings of Loseva et al. and Mengelbier would not, to any degree, teach or even suggest the process for extract purification of sugar beet raw juice as recited in any of applicants' claims 1-2, 6, 9-11, 14-21, 23-24, 26, 27, 32, 35, 37, 39 and 42-43.

Therefore the Examiner is respectfully requested to reconsider and withdraw the rejection under 35 U.S.C. §103 of the subject claims.

Next, claims 3 and 33 are rejected on p. 10 of the Office Action under 35 U.S.C. §103 over Loseva in view of Mengelbier and further in view of Guyot (EP 1022343). This rejection is also respectfully traversed.

Claim 3 depends from claim 1 and claim 33 depends (indirectly) upon claim 27. The claims further define the "first removal apparatus" recited in the independent claim(s) as constituting a static or dynamic decanter. Both of these claims, however, also include all of the features of the independent claim from which they depend. Due to the fact that both claim 27 and claim 1 recite features which distinguish the subject claim over the combination of Loseva and Mengelbier, applicants respectfully submit that claims 3 and 33 are, thus, also distinguishable over this combination for the same reasons as the respective independent claims 1 and 27. Furthermore, the addition of Guyot to the combination of Loseva and Mengelbier does not remedy the above-described deficiencies. That is, Guyot is cited (see the bottom of p. 10) due to its teaching that decanters are suitable for processing sugar beet juice. However, taking that disclosure in combination with the teaching of Mengelbier that sugar beets are a source of sugar sap and the teaching in Loseva et al., with regard to an extraction process, discussed in detail above, would neither teach or even suggest applicants' claimed process due to the deficiencies, identified above, of the disclosure contained in Loseva et al.

For the above reasons, therefore, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 3 and 33.

In like manner to the rejection discussed above, claims 4, 5 and 34 are rejected on p. 11 of the Office Action under 35 U.S.C. §103 over the combination of Loseva et al., Mengelbier and Rawlings (U.S. Patent No. 2,413,844). This ground of rejection is also traversed by applicants.

As in the case of claims 3 and 33 discussed above claims 4, 5 and 34 are each written in dependent form and they all depend, directly or indirectly, from claim 1. As such they each include all of the features contained in the independent claim. As noted above, as claim 1 is deemed by applicants to be distinguishable over the combination of Loseva et al. And Mengelbier, so also are claims 4, 5 and 44, i.e. for the same reasons as claim 1.

Nor does the addition of the Rawlings reference bring one any closer to the claimed process. That is, claims 4 and 34 define the first removal apparatus as being a centrifuge, whereas claim 5 further defines the centrifuge of claim 4 as constituting a pan centrifuge or a decanter centrifuge. The Rawlings reference is cited by the Examiner, as indicated on p. 11, due to its teaching that the use of a pan centrifuge is suitable for the processing of sugar beet products. However such teaching does not remedy the several deficiencies, identified above, in the disclosure of Loseva et al. And thus its combination with Loseva et al. and Mengelbier serves no more to teach or even suggest applicants' claimed process than does the 'main' combination of Loseva et al. and Mengelbier.

Thus, for the reasons presented above the Examiner is respectfully requested to reconsider and withdraw the rejection of applicants' claims 4, 5 and 34.

Claim 7 is, next, rejected on p. 12 of the Office Action under 35 U.S.C. §103 over Loseva in view of Mengelbier and further in view of Briones (DE 19628183 A1). This rejection is traversed as well.

As in the case of the rejections discussed above, claim 7 is a dependent claim that depends (indirectly) from claim 1. Thus the subject claim, which further defines the second removal apparatus (recited in claim 6) as being at least one membrane filter press, includes all of the features recited in independent claim 1. Claim 1, as indicated above, is submitted by applicants as being distinguishable over the combination of Loseva et al. and Mengelbier and thus claim 7 is also believed to be distinguishable over that combination for the same reasons as claim 1. Nor does the addition of the Briones reference resolve the deficiencies of, e.g., Loseva et

al. That is, as indicated at p. 12 Briones is cited due to its disclosure that membrane filter presses are known to be suitable for the intended use of processing sugar juices. Even taking this characterization at face value, however, one having an ordinary level of skill in this art, upon combining the teachings contained in Briones with that found in Loseva et al and Mengelbier, still would not find taught or even suggested therein the process as presently recited in, e.g., claim 1. The reason(s) in support of this conclusion are set forth in the discussion above of the Loseva et al reference and the differences between that reference and applicants' process as presently claimed.

For the reasons presented above, therefore, the Examiner is also respectfully requested to reconsider and withdraw the rejection of claim 7.

At the bottom of p. 12 in the Office Action claims 8, 22 and 36 are rejected under 35 U.S.C. §103 over Loseva et al. in view of Mengelbier and further in view of Cottrell (USP 2,281,025), i.e., for the reasons given on p. 13. This rejection is also traversed.

Claims 8, 22 and 36 each further defines the second removal apparatus recited for use in applicants' claimed process as constituting one or more of at least one of decanter centrifuge(s), pan separators and vacuum rotary filters. The claims are written in dependent form and thus, as indicated above, they include all of the features recited in the independent claim from which they depend. The features contained in the independent claims are deemed, for the reasons presented above, to distinguish those independent claims and thus, also, the dependent claims, from the combination of Loseva et al. and Mengelbier.

The Cottrell reference, as indicated at p. 13 of the Office Action, is cited by the Examiner due to its disclosure that vacuum rotary filters are known to be suitable for the processing of sugar beet products. Even so, however, the combination of this disclosure with that contained in Loseva et al. and Mengelbier still would not teach, or even suggest the process as recited in the corresponding independent claims. Thus claims 8, 22 and 36 are also submitted as being distinguishable over the cited combination relied upon by the Examiner to reject them for the same reasons as the corresponding independent claims.

The Examiner, thus, is respectfully requested to reconsider and withdraw the rejection of claims 8, 22 and 36 under 35 U.S.C. §103.

On p. 13 claims 13 and 25 are rejected under 35 U.S.C. §103 over Loseva et al. and Mengelbier, and further in view of Junker (DE 3238783 A). This rejection is traversed as well.

Claims 13 and 25, which are both written in dependent form, each recite that the first carbonated juice from the process recited in the corresponding independent claim is filtered by means of a candle filter to obtain a first carbonated juice concentrate and a first clear carbonation juice. Due to the fact that the claims are written in dependent form, as indicated above they include all of the features recited in the independent claim from which they depend. The features contained in the independent claims are deemed, for the reasons presented above, to distinguish those independent claims and thus, also, the dependent claims, from the combination of Loseva et al. and Mengelbier. The Junker reference, as indicated at p. 13 of the Office Action, is cited by the Examiner due to its disclosure that the art finds the use of a candle filter suitable for the filtration of limed beet sugar juice. Even so, however, and taking the Examiner's characterization at face value, the combination of this disclosure with that contained in Loseva et al. and Mengelbier still would not teach, or even suggest the process as recited in the corresponding independent claims.

Thus claims 13 and 25 are also submitted as being distinguishable over the combination of Loseva et al., Mengelbier and Junkers for the same reasons as the corresponding independent claims. The Examiner is therefore respectfully requested to reconsider and withdraw the rejection of claims 13 and 25 under 35 U.S.C. §103.

Further to the above, on p. 14 claims 28-30 and 40 are rejected under 35 U.S.C. §103 over the combination of Loseva et al. and Mengelbier, and further in view of the combination of Gray, Owens, Hippchen, Vermeer and Volkmar. Applicants traverse this ground of rejection as well.

The Examiner in the Office Action characterizes claims 28-30 as reciting a variety of components inherently present in sugar beets, that Loseva is silent about. The case is the same with regard to claim 40. The Examiner thus cites a number of 'secondary' references, i.e, Gray, Owens, Hippchen, Vermeer and Volkmar as a teaching that the various materials recited in the rejected claims are present in raw sugar beet juice.

What must be taken into account, however, is that the claims included in the subject rejection are written in dependent form. Thus, as pointed out above, the claims additionally include all of the features recited in the independent claim from which they depend. Applicants believe that it is established above that the independent claims are distinguishable over the combination of Loseva et al. and Mengelbier and, thus the rejected dependent claims are distinguishable over that combination for the same reason(s). Even taking the characterization of Gray, Owens, etc. at face value, however, the addition of the disclosure contained in these ‘secondary’ references still does not remedy the deficiencies, discussed above in detail, inherent in the combination of Loseva et al. with Mengelbier. Therefore, even the cited combination of any or all of Gray, Owens, etc. with Loseva et al + Mengelbier would neither teach or even suggest the process as recited in the independent claims and thus it also does not teach or suggest the process as recited in the rejected dependent claims.

The Examiner is, therefore, respectfully requested to reconsider and withdraw the rejection of claims 28-30 and 40.

At p. 16 of the Office Action claim 41 is rejected under 35 U.S.C. §103 over Loseva et al. in view of Mengelbier and further in view of Ekern (USP 5,759,283). This rejection is also respectfully traversed.

Claim 41 recites that the non-sucrose substance concentrate recited in claim 39 (produced in accordance with the method recited in claim 1) has a high phosphorous content. Taking into account the claimed subject matter, therefore, the Examiner has included Ekern in the combination of references due to its disclosure, as indicated at p. 16, that non-sugar impurities of the raw sugar beets include phosphates, which are known to have a high phosphorous content.

However, as indicated above, claim 41 is written in dependent form and, as such, it includes all of the features recited in claims 39 and 1. Clearly, taking into account the discussion above concerning the deficiencies exhibited by the combination of Loseva with Mengelbier, it is submitted that the disclosure of Ekern, i.e, regarding phosphate having a high phosphorous content would not remedy those deficiencies. Thus, even the combination of Loseva et al. + Mengelbier + Ekern would neither teach nor even suggest applicants’ claimed process or the

product produced thereby. The Examiner is, therefore, requested to reconsider and withdraw the rejection of claim 41 under §103.

In addition to the above, in the portion of the Action bridging pp. 16-17 claims 38 and 44 are rejected under 35 U.S.C. §103 over Loseva et al. and Mengelbier and further in view of the Southern Minnesota Sugar Cooperative: Booklet of 1999. This ground of rejection is additionally traversed.

Claims 38 and 44 are directed to what occurs with the concentrated coagulate which, in the case of claim 33, is comminuted and dried; whereas in the case of claim 44 it is comminuted, mixed with molasses and dried. The claims are written in dependent form and the concentrated coagulate referred to, therefore, is the coagulate recited in, respectively, claim 27 and 39/1. As in the case of the several rejections discussed above, the independent claims from which the rejected claims depend are deemed by applicants to be distinguishable over the combination of Loseva et al. And Mengelbier. The Southern Minnesota Sugar cooperative: Booklet of 1999 is cited by the Examiner, as explained at p. 17, due to its disclosure that by-products of sugar beet processing may be treated as claimed (i.e., in claims 33 and 44). However, even if one were inclined to combine this disclosure with that contained in the combination of Loseva et al. and Mengelbier they would still not find the process as recited in applicants' claims taught or even suggested, due to the fact that even taking the disclosure of the Southern Minnesota reference at face value, this disclosure would not remedy the deficiencies, set forth in detail above, exhibited by the combination of Loseva et al. and Mengelbier.

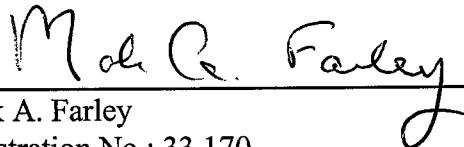
For all of the reasons above the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 38 and 44.

**Summary**

Applicants respectfully submit that the claim amendments and arguments presented herein are believed to overcome all of the claim rejections set forth in the present Office Action. The Examiner is, thus, requested to reconsider and withdraw all of the rejections and to issue a Notice of Allowance for all of the pending claims.

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